

Dawn of a Thousand Sun

Or How a Letter Made the Bomb Unavoidable

by Stefano Ruzza

The Einstein-Roosevelt correspondence

The starting point of the (real) history of the development of nuclear weapons can be traced to the Einstein-Roosevelt correspondence. The facts are well documented: the community of Hungarian physicists transplanted in the US, leaded by Leo Szilárd (and including Edward Teller and Eugene Wigner), was seriously concerned about the possible development of nuclear weapons by Nazi Germany. Hence, in July 1939—so just before WW2 broke out in Europe—Szilárd paid several visits to his old acquaintance, Albert Einstein, to convince him to urge the Roosevelt administration to provide Federal support to nuclear research. Szilárd original intention was to use Einstein's connections to the Belgian royal family for pressuring the latter to protect Congo and its uranium ore from German hands¹, but then grown into the idea of getting in touch with the US President instead. In the end, Szilárd drafted the letter and Einstein signed it on August 2, 1939. In short, the letter asked the Administration for three things: to coordinate with the community of American scientists working on the chain reaction; to secure research funds (also by rationalizing already existing efforts); and to address the problem of uranium ore, at the time scarcely available in the US.

Einstein fame was enough to guarantee reception of the letter by Roosevelt, although delayed by the beginning of hostilities in Europe and thus reaching him only on October 11. The President reacted positively to the letter, setting up an ad-hoc group—the so-called «Uranium Committee», convened for the first time on October 21—and providing a startup alloca-

¹ As feared by Szilárd, the Belgian ore eventually fell into German hands after the invasion of Belgium in May 1940, fuelling the *Uranverein* first and, following the fall of Germany, the Soviet nuclear program.

Albert Einstein
Old Grove Rd.
Massau Point
Peconic, Long Island
August 2nd, 1939

F.D. Roosevelt,
President of the United States,
White House
Washington, D.C.

Sir:

Some recent work by E. Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into a new and important source of energy in the immediate future. Certain aspects of the situation which has arisen seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe therefore that it is my duty to bring to your attention the following facts and recommendations:

In the course of the last four months it has been made probable - through the work of Joliot in France as well as Fermi and Szilard in America - that it may become possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power and large quantities of new radium-like elements would be generated. Now it appears almost certain that this could be achieved in the immediate future.

This new phenomenon would also lead to the construction of bombs, and it is conceivable - though much less certain - that extremely powerful bombs of a new type may thus be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port together with some of the surrounding territory. However, such bombs might very well prove to be too heavy for transportation by air.

tion for research of \$6,000 in funds. He also sent a thank you letter back to Einstein. The Uranium Committee, leaded by Lyman Briggs, included Szilard and his henchmen but not Einstein. The reason behind his absence is twofold: on one hand, Einstein himself did not have any desire to be part of such an endeavor; on the other his reputation for pacifism (along with the fact he did not obtain US citizenship until 1940) made the security and intelligence community wary of his involvement².

The lingering question here is: could anything in this story have gone any differently? And if the answer is yes, what kind of world would have been brought into existence? These questions are particularly seductive when related to the Einstein-Roosevelt correspondence and thus the very «dawn» of the nuclear age. But it is not just a matter of playing with «ifs» in history – as fun as it may be – since this exercise also helps in bring into focus how concrete alternatives have actually been and what made history lean in the direction it did in the end instead of taking any other³.

2 About the Einstein-Roosevelt correspondence, see: Richard G. Hewlett and Oscar E. Anderson, *The New World, 1939–1946* (University Park: Pennsylvania State University Press, 1962); Walter Isaacson, *Einstein: His Life and Universe* (New York: Simon & Schuster, 2007). The letter itself is in the Franklin D. Roosevelt Library in Hyde Park, NY. An electronic copy of the letter (and of the following ones) could be accessed at: <http://hypertextbook.com/eworld/einstein.shtml>.

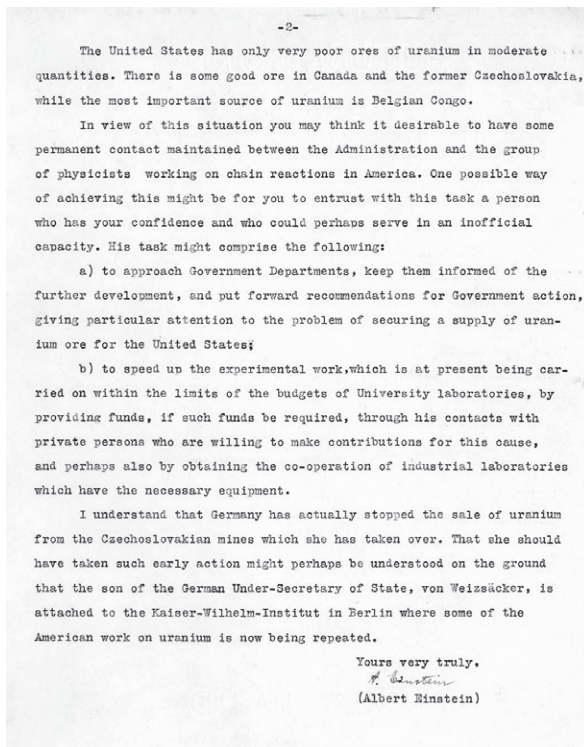
3 The utility of counterfactual history has been effectively explained by Rusconi. See Gian Enrico Rusconi, *L'azzardo del 1915: Come l'Italia decide la sua guerra* (Bologna: Il Mu-

Could anything have gone any differently?

The Einstein-Szilárd letter of August 2 started its very own «chain reaction» that—although in slow motion—eventually brought to the Manhattan project first and to the detonations of the atomic bombs on Hiroshima and Nagasaki later. On this base, it could be argued that if the Einstein-Roosevelt correspondence would have not took place, no nuclear weapons would have had come into existence—or at least not as early as mid-1945. The

very fact that after the war Einstein expressed regret about his decision⁴, seems to support the idea that things could have gone differently had Einstein acted in another way. But is this really the case?

Einstein may have been wrong in evaluating the stage and the pace of the German nuclear program (which has been all along quite inconclusive), but fears about it were quite widespread at the time. And even if grounded on poor information, it is hard to deny the solidity of Einstein's convictions back then, as he wrote *two* more times to Roosevelt after his first letter, in March and in April 1940 respectively, suggesting to withhold scientific publications that may leak relevant knowledge to the Germans (something that aroused the interest of the Soviets though)⁵ and to speed



lino, 2005).

4 *Scientist tells of Einstein's a-bomb regret*, «The Philadelphia Bulletin», 13 May 1955.

5 Interestingly enough, the Soviet nuclear program was accelerated as well by a letter wrote by a physicist - Georgiy Flyorov - to his head of state - Iosif V. Stalin -, in this case in April

up nuclear research⁶. But in order to evaluate the feasibility of an alternative past it is not enough to consider just Einstein's commitment on nuclear matters, as it is necessary to take into account also the motives and the resolve of the other major actors in this story.

Starting with Szilárd, it is hard to question the strength of his commitment either—and not only because he was the force that set Einstein into motion. On this, it is useful to recall some more facts. In early 1939, Szilárd worked on chain reaction side by side with Enrico Fermi at Columbia University. In a presentation held at the Navy Department, Fermi explained the ongoing Columbia experiments aimed at verifying the concrete possibility of a chain reaction. Fermi was unsure that such a result could be achieved, but he also stated that if such a reaction proved possible then it could have lead to the use of uranium as an explosive. Although this aroused some interest in the audience (and managed to secure some funds), his cautious stance made the Navy also quite lukewarm on nuclear research. Afterwards, a direct acquaintance of Roosevelt, the economist and banker Alexander Sachs, had the chance to learn about the Navy opinion from the President himself⁷.

As it has been mentioned already, Szilárd original intention was to recruit Einstein to warn the Belgian royal family of the need to protect their uranium ore from German hands. But when Szilárd got in contact with Sachs he switched to the idea of reaching out to the US President and to change the Administration view on nuclear matters instead. To this end, Szilárd needed two things. First, a scientist with fame equal or superior of Fermi's, in order to overcome the cautious impression made by his Italian colleague—and to that end, he got Einstein. Second, a man able to reach FDR directly, to avoid his message getting lost in the plethora of communications trying to reach the President's desk daily—and for that he got

1942. For this letter and the Soviet nuclear program in general see Thomas B. Cochran, Robert S. Norris and Oleg A. Bukharin, *Making the Russian Bomb: From Stalin to Yeltsin*, (Boulder: Westview Press, 1995).

6 There is a fourth letter from Einstein to FDR, dated 25 March 1945, but it is basically an attempt from the side of Einstein to broker a meeting between FDR and Szilárd.

7 Richard G. Hewlett and Oscar E. Anderson, *The New World, 1939–1946* (University Park: Pennsylvania State University Press, 1962).

Sachs. What does all of this prove about Szilárd? Firstly, it shows that he was committed to the matter to the point of trying to overcome the impression made by a close and respected colleague (Fermi was awarded the Nobel prize in 1938). Secondly, it demonstrates how focused Szilárd was on his goal of pushing for nuclear research, as he quickly dropped a minor objective (reaching the Belgian royalty) in favor of a major one (getting in touch with the US president).

On this background, it could be argued that if Einstein would have not been willing to help Szilárd perhaps the Hungarian may have had a hard time finding a suitable substitute. Is this the weak link in the chain of events then? Maybe, but it should not be forgotten how much Germany was feared or despised by the scientific community that had to leave Europe in order to flee Nazi domination and racial laws. A community of which Einstein, Fermi, Szilárd, Teller and Wigner were all part of. This accounts for Szilárd's own commitment of course, but also makes it hard to assume no support was going to come out of Einstein, at least as an effort to contain Germany. Or that in the absence of Einstein's support Szilárd would have not been able to find any other sympathetic supporter (perhaps Fermi himself).

Could then be Sachs the weak link? The doubt may lie not really in his willingness to reach FDR with the letter (he was a Jew too, so had his own good reason to be wary of Nazi Germany) but in his ability to do so, and especially at such a hectic time as around the beginning of WW2 in Europe. Indeed, Einstein signed the letter in August 2 while it reached Roosevelt only on October 11. So what happened between those two dates? The first two weeks were lost in logistics: Einstein posted the letter to Szilárd first, and then Szilárd delivered it to Sachs. This makes the clock tick forward to August 15. From there, the storm coming over Europe made it hard for Sachs to get an appointment with the President, and at a time that would allow Roosevelt to give proper attention to the issues mentioned in the letter too.

Sachs achieved his goal on October 11, and we all know how things moved from there. But what would have happened if the banker would have been unable to deliver the letter? Again, this hardly seems something that could have made a substantial difference as Einstein and Szilárd were constantly on the lookout for alternative «couriers». For one, being not

entirely sure about Sachs, they attempted to get in touch with air celebrity Charles Lindbergh asking him the same service they asked Sachs. The two scientists were of course unaware of Lindbergh political leanings – along with the fact he was decorated by Hermann Göring just one year earlier.

They finally realized that Lindbergh was not their man when he aired a speech advocating for isolationism on September 15. The dissolution of the Lindbergh option left everything in Sachs' hands. But the fact that Einstein and Szilárd tried to open up *two* channels leading to Roosevelt instead of just one, again proves how serious they were in trying to reach the chief of the executive. And as time ticked away, Szilárd met anew with Sachs in late September, pressuring him to deliver the letter. Szilárd then agreed with Einstein to leave Sachs a grace time of about ten more days⁸. Sachs managed to meet the deadline, but if he would not have been able to it is logical to assume Einstein and Szilárd would have been working on alternative paths, same as they did before – albeit clumsily – with Lindbergh.

All in all, on the «senders» side wills were firm, intentions clear and plans resilient. In many ways they can be considered the embodiment of the old military wisdom that «if there is a will, there is a way» and it is indeed quite hard to question that – sooner or later and *mutatis mutandis* – they would have been able to reach Roosevelt's ears (and eyes) with their pledge for nuclear research. The quest for an alternative history of nuclear weapons seems really short of wiggling space here. But could the same be said also about the «recipient» side of the correspondence – i.e. the US administration?

Long story short, once again, the answer is yes. Since Einstein and Szilárd were trying to reach directly for the President, this cuts bureaucratic politics out of the picture. On the top of that, the fact that the two scientists were on the lookout for a sensible courier – capable to use his prestige and personal connections in order to guarantee not only reception of the message but also enough attention devoted to it – also cuts out the possibil-

8 Walter Isaacson, *Einstein: His Life and Universe* (New York: Simon & Schuster, 2007); William Lanouette, and Bela Silard, *Genius in the Shadows: A Biography of Leo Szilárd, The Man Behind The Bomb* (New York: Charles Scribner's Sons, 1992); Richard Rhodes, *The Making of the Atomic Bomb* (New York: Simon & Schuster: 1986).

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Office of A.C. of S., G-2, Hq. 2nd Corps Area, Governors Island, N.Y.,
August 13, 1940. - To: A.C. of S., G-2, War Department, Washington, D.C.

1. With reference to the basic letter, the following information is submitted:

(1) ENRICO FERMI, Department of Physics, Columbia University, New York City, is one of the most prominent scientists in the world in the field of physics. He is especially noted for breaking down the atom. He has been in the United States for about eighteen months. He is an Italian by birth and came here from Rome. He is supposed to have left Italy because of the fact that his wife is Jewish. He has been a Nobel Prize winner. His associates like him personally and greatly admire his intellectual ability. He is undoubtedly a Fascist. It is suggested that, before employing him on matters of a secret nature, a much more careful investigation be made. Employment of this person on secret work is not recommended.

(2) MR. SZELARD. It is believed that this man's name is SZILLARD. He is not on the staff of Columbia University, nor is he connected with the Department of Physics in any official capacity. He is a Jewish refugee from Hungary. It is understood that his family were wealthy merchants in Hungary and were able to come to the United States with most of their money. He is an inventor, and is stated to be very pro-German, and to have remarked on many occasions that he thinks the Germans will win the war. It is suggested that, before employing him on matters of a secret nature, a much more careful investigation be made. Employment of this person on secret work is not recommended.

2. This information has been received from highly reliable sources.

/s/ S. V. CONSTANT

S. V. CONSTANT,
Lieutenant Colonel, Cavalry,
Acting Assistant Chief of Staff, G-2.

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ity of the letter being overlooked. So the only variable that remains at stake is Roosevelt himself. Could have him welcomed Einstein's (and Szilárd's) letter in any cooler way than he actually has? It seems unlikely. For one, when he answered positively to it the United States were not yet at war with Germany. This means Roosevelt acted just on precaution, especially given that among the American public opinion isolationist, pro-German and pro-Communist feelings were quite widespread. True, the letter has been received after WW2 broke out in Europe, so that may have ringed an alarm bell and made him more sympathetic to the call for action. But if the letter would have been received any sooner it would have got into Roosevelt hands not much in advance of September 1 anyway. So it seems difficult to argue he would have reacted very differently if he would have received it between August 15 (the day Sachs got it from Einstein) and September 1 (the date of the invasion of Poland). To put it shortly, while Roosevelt did provide an important spin to nuclear research he did not mobilize a massive effort around it (yet)⁹ and there is no ground to argue he would have done anything less than what he did had some circumstance changed.

Conclusions: if the Bomb doesn't drop

The «dawn of the Bomb» – as the time between July and October 1939 could be labeled – seems not to provide very good opportunities to rewrite the history of nuclear weapons. Does this means that this story could not be rewritten at all? Of course not, but perhaps points of departure from real history have to be searched at other times. One of them could maybe be located in May 1945, as the fall of Germany made not straightforward keeping together and focused a group of scientists strongly motivated by the fear of a Nazi nuclear program. At that point in time though, the development of the Bomb was already at such an advanced stage that it would

9 More substantial US government support will come later, in 1940 with the creation of the National Defense Research Committee, in 1941 with the establishment of the Office of Scientific Research and Development, and – finally – in 1942 with the Manhattan project proper. See F.G. Gosling, *The Manhattan Project: Making the Atomic Bomb* (Washington DC: US Department of Energy, 2010); Richard G. Hewlett and Oscar E. Anderson, *The New World, 1939–1946* (University Park: Pennsylvania State University Press, 1962).

have likely come into existence nonetheless, suffering just some delay. But even if we push our imagination to think of a nuclear-less Second World War – be it for a reason or another – that would have not changed that same war much, since the Axis was defeated with conventional means. It could be debated at length, of course, if the nuclear bombings of Hiroshima and Nagasaki avoided a military invasion of Japan, and how long and bloody such invasion would have been. But it is out of question that Japan would have collapsed eventually anyway.

Where a different path in the development of nuclear weapons would have made a major difference is in the following confrontation though – the Cold War – since no nukes (or their delayed appearance) may have made it not so «cold» in the end. In this perspective, it becomes interesting to question what would have happened if the Americans had not used nuclear weapons on Japan in August 1945. Szilárd, in a interview released in 1960, stated that a different course of action on that would have made further military nuclear research in the US faster – as it would have limited defection of scientists due to moral delusion – and in the URSS slower – as the Soviets would have missed a major incentive to push the accelerator on it – hence making the US nuclear monopoly last longer¹⁰. His arguments though are easy to reverse, as the URSS may have invaded Japan in the last months of WW2, or it could have become more aggressive after the end of the war (given the absence of a clear nuclear demonstration). But all of these are whole different (hi)stories.

10 Leo Szilárd, *President Truman Did Not Understand*, «U.S. News & World Report», August 15, 1960.

